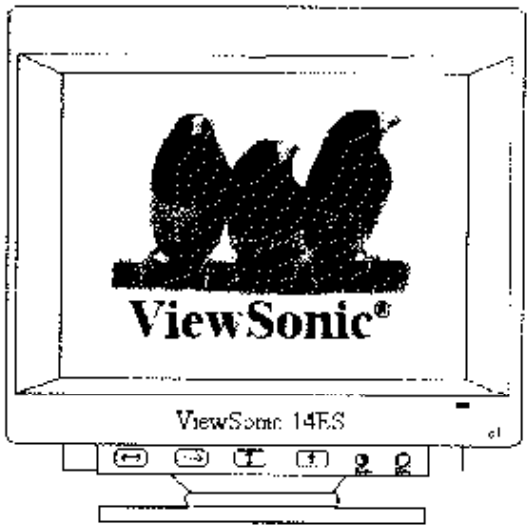
Service Manual

ViewSonic 14ES

Model No. 1448ES-1

14" Analog Controlled Color Monitor
Entré Series



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Chapter 1

Introduction

This manual describes a low-cost, high-performance 14-inch color, triple-frequency monitor. It is compatible with all IBM VGA modes at 31.5-KHz as the SVGA2 mode at 37.86KHz, SVGA3 mode at 48.09KHz, SVGA4 at 46.88KHz, and UVGA 1024 x 768 non-interlaced mode at 48.363 KHz.

It has the following features.

- Energy-saving functions
- 0.28-mm trial pitch anti-glare CRT
- User controls are all located on the front bezel:
  - contrast
  - brightness
  - power on/off
  - H-size
  - H-phase
  - V-size
  - V-center
- Power On/Off indicator
- Suspend mode indicator with flashing
- Universal power supply
- Power on auto degaussing
- Tilt-and-swivel base
- Detachable power cable
- VGA resolution at 31.5MHz
  - 640 x 350
  - 640 x 400
  - 640 x 480
- VESA VGA resolution: 640 x 480 at 37.86KHz

- SVGA2 resolution: 800 x 600 at 37.88KHz
- SVGA3 resolution: 800 x 600 at 48.09KHz
- SVGA4 resolution: 800 x 600 at 46.88KHz
- Automatic scanning horizontal frequencies at
  - 31.5-KHz
  - 37.8KHz
  - 46.88KHz
  - 48.36KHz
  - all vertical frequencies between 50-Hz and 90-Hz
- optional VLM function

1.1 Operational Specifications

1.1.1 Environment

Temperature	
Operating	10 to + 40 degrees Celsius
Non-operating	-20 to + 60 degrees Celsius

NOTE: *If tested without its packaging, the maximum non-operating temperature is 52 degrees Celsius*

Humidity	
Operating	20% to 90%, non-condensing
Non-operating	10% to 95%, non-condensing

Altitude	
Operating	0 to 3,048 m (10,000 ft)
Non-operating	0 to 12,192 m (40,000 ft)

NOTE: *Operating condition = without packing*
Non-operating condition = with packing

1.1.2 Electrostatic Discharge Requirements

This monitor must withstand 15 KV voltage test of Electrostatic Discharge (ESD) and meet the acceptance criteria.

1.1.3 Safety Requirements

This monitor complies with the following safety standards and specifications:

110V Model

- UL compliance - standard for information-processing and business equipment, UL 1950
- CSA compliance - standard C22.2 No. 950-M89, data-processing equipment
- DHHS rule 21, sub-chapter J as of the manufacturing date

220V Model

- TUV compliance - IEC950 safety specification for business equipment
- TUV Ergonomic - IEC950 – MPRII + ISO 9241-3
- PTB - German X-ray emission standards
- ZH1/618 - German Ergonomic standard
- Demko - IEC 950
- Nemko - IEC 950
- Semko - IEC 950
- Femko - IEC 950

1.1.4 EMI Requirements

This monitor complies with the following RFI rules and regulations:

110V Model

- FCC compliance - FCC Rule, Part 15, Sub-part B, Class B
- VCCI compliance - VCCI Rule, Class 2

220V Model

- FTZ compliance - FTZ regulations No. 243/1991 for RFI suppression, Class B
- DNSF compliance - Scandinavia
- Low-radiation rule (MPR-II) is an option

1.1.5 Acoustics Noise

When the monitor is operating, the sound level is contained within 40 dB/A in the audible field.

1.1.6 Reliability

The MTBF of the monitor is greater than 40,000 hours, excluding the picture tube.

1.2 Input/Output Signal Specifications

1.2.1 Input Signal Requirements

1. Signal Cable - directly attached to the unit

   - Video Inputs - This 15-pin mini D-sub connector is on the captive signal cable for IBM VGA, 8514A or compatible adapters. The following table lists the pin assignments:

Pin No.	Signal
1	Red Video
2	Green Video
3	Blue Video
4	Ground
5	EPS1
6	Red Ground
7	Green Ground
8	Blue Ground
9	No Connection
10	Sync Ground
11	Ground
12	No Connection
13	H. Sync
14	V. Sync
15	No Connection

   - Cable Length: 1500 mm ± 20 mm

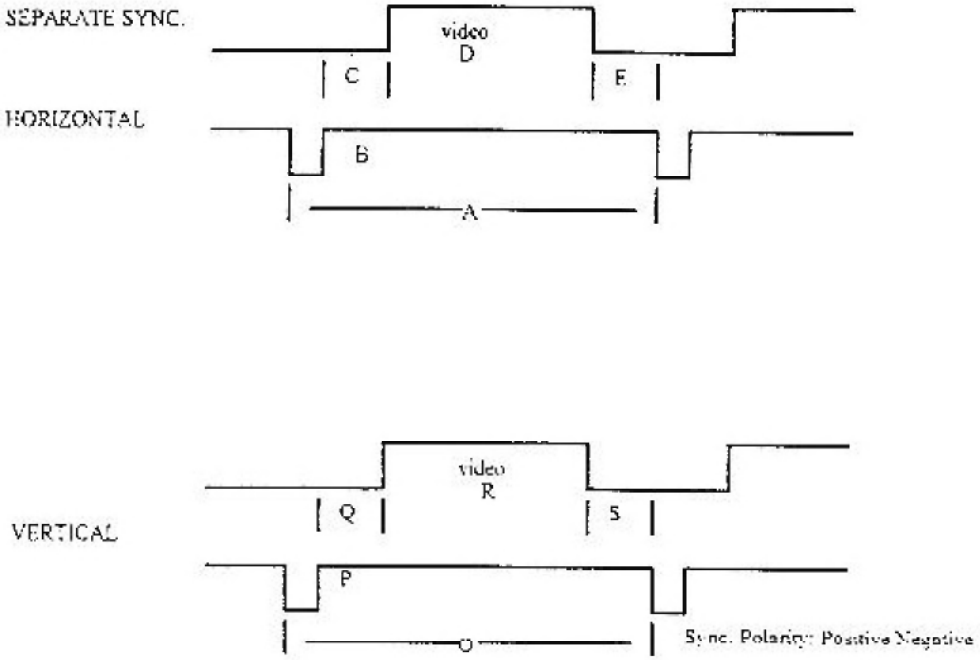
2. Video Signal: Analog 0.7 Vpp/75 ohm positive

3. Sync Signal

   - Separate SYNC: TTL level
   - Horizontal SYNC: positive/negative
   - Vertical SYNC: positive/negative

4 Timing

The video signal timing is as follows



Preset Timing

VGA/SVGA/UVGA Timing

	VGA Compatible			VESA VGA Compatible
fH	31.47KHz			37.86KHz
Aus	31.77KHz			26.413KHz
Bus	3.81KHz			1.27KHz
Cus	1.59KHz			4.603KHz
Dus	26.05 (w/border)			20.317KHz
Eus	0.318KHz			0.762KHz
fv	70.08KHz	70.08KHz	59.94KHz	72.809KHz
Oms	14.27KHz	14.27KHz	16.68KHz	13.735KHz
Pms	0.064KHz	0.064KHz	0.064KHz	0.079KHz
Qms	1.68KHz	0.86KHz	0.76KHz	0.740KHz
Rms	11.502KHz	13.157KHz	15.762KHz	12.678KHz
Sms	1.02KHz	0.091KHz	0.095KHz	0.238KHz
Display Resolution	640x350	640x400	640x480	640x480
Polarity H/V	+/+	-/+	-/-	-/-

	SVGA2	SVGA3	SVGA4	UVGA
(fH)	37.879KHz	48.09KHz	46.88KHz	48.363KHz
(Aus)	26.4KHz	20.794KHz	21.333KHz	20.677KHz
(Bus)	3.2KHz	2.399KHz	1.616KHz	2.092KHz
(Cus)			3.232	4.603KHz
(fv)	60.3165KHz	72.0KHz	75.0KHz	60.0KHz
(Oms)	16.579KHz	13.88KHz	13.333KHz	16.66KHz
(Pms)	0.106KHz	0.667KHz	0.064KHz	16.66KHz
(Qms)	0.607KHz	0.667KHz	0.448KHz	0.6KHz
(Rms)	15.840KHz	12.51KHz	12.8KHz	15.88KHz
(Sms)	0.026KHz	0.772KHz	0.021KHz	0.062KHz
Display Resolution	800x600	800x600	800x600	1024x768
Polarity H/V	+/+	-/+	+/+	-/-

5. Input Signal Quality

Rise/Fall time	Video Signal: less than 6ns Horizontal Sync: less then 50ns Vertical Sync: less than 100ns
TTL Signal Level	The levels of Horizontal and Vertical Sync are: TTL level with a high level of 2.4-5.5V, and a low level of 0 - 0.2V.
Video Signal Level	When terminated with an ideal 750 ohm termination, the video signal will have a range of 0V to 0.7V (nominal), and its full scale output will be 0.7V, and the black level will be between 0V and 0.1V.

1.2.2 Power Supply Requirements

Power Management

The monitor handles the power-saving modes according to the final VESA specification with H-sync and V-sync recognition. The green power LED flashes only at OFF mode as follows:

	H-Sync	V-Sync	Power	LED	EPS1	Recovery Time
Stand-by	Inactive	Active	< 60W	Green	GND	1 sec
Suspend*	Active	Inactive	< 5W	Amber Blinks	GND	8 sec
Off	Inactive	Inactive	< 5W	Amber Blinks	GND	8 sec
Burn-in	Inactive	Inactive	> 30W	Green	Floating	---

NOTE: *The picture should appear within 10 seconds after the system is* activated.

The performance of the unit should be at the normal specifications within 30 minutes after the system is activated.

Input Power Requirements

1. Input Voltage Range - the unit shall meet all the operating requirements with an input voltage range of 90 - 264 Vac

2. Input Current -

Maximum Input Current	Measuring Range
(MAX) 2.2 Arms	90 Vac - 264 Vac

3. Frequency Range - the unit shall operate within a frequency range of 47 Hz to 63 Hz

4. Inrush Current - Power supply inrush current shall be less than the ratings of its critical components. (including power switches, fuse, rectifiers and surge limiting device) for all conditions of line voltage

5. Regulatory Efficiency - 65% minimum (measuring at 115 Vac and full load)

6. Synchronization - The switching frequency of the unit must be designed to synchronize to the horizontal frequency of the display unit.

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* Suspend mode is an option available to customers. Unless requested, the suspend mode is the same as the Off mode.

7. Power Line Transient Immunity - The power supply shall function properly after being subjected to a 0.3us/1.2us, 2000 volt high peak pulse, or 5ns/10ns, 1500 volt fast peak pulse applied either differentially or single endedly to a line and neutral at any phase of the power line voltage and shall not cause unsafe or unrecoverable errors.

8. Maximum Power Consumption - 90 Watts

Output Power Requirements

The power circuit supplies DC power outputs as follows:

Output	Normal	Regulation	Load Current Range
1	90/115/150V	±3%	0.14A-0.50A
2	190V	±3.5%	0.02A-0.15A
3	12V	±5%	0.2A-0.80A
4	6.3V	±3.5%	0.51A-0.75A

The above output voltage is dependent on fH (horizontal frequency), it changes from 62V to 100V. When fH is fixed, its regulation is a total of 6% from minimum to maximum output

AC Power Inlet

The display unit shall be supplied with an AC power NICOON NC-174 (or equivalent), to be located at the rear of the display.

Power Cord

Each display unit shall be supplied with an 1800-mm king cord power cord KC-003 or its equivalent.

1.2.3 CRT Requirements

The color picture tube is 14", 90 degrees and has the following features:

- type: 14" in-line, dot matrix
- dot pitch: 0.28mm dot triad
- phosphor: P22 or equivalent
- light transmittance: 57% (semi-tint)
- surface of face plate: non-glare

1.3 Functional Specifications

All the tests to verify specifications in this section must be performed under the following standard conditions unless otherwise noted. The standard conditions are.

Temperature	25 +/-5 degrees Celsius
Magnetic Field	No additional magnetic field near the side, and the CRT faces East
AC Line Input Voltage	90 Vac to 264 Vac, 50 Hz or 60 Hz
Warm-up Time	30 minutes minimum
Checking Display Mode	All the presetting modes

1.3.1 Display Quality

Display Data Area (with 20 ft-l at full white pattern)

1. Horizontal: 250mm ± 4mm

2. Vertical: 187mm + 4mm

Video AMP Performance

1. Video bandwidth: 65MHz

2. Resolution: 1024 x 768 (center)

3. Effective rise teff time: 10ns maximum

4. Ringing: 15% maximum, first overshoot

   4% maximum, second overshoot

   1% maximum third overshoot

5. Sag: 5% maximum (at horizontal frequency)

Light Output

1. At 3" block pattern (ABL is non-working): 60Ft-L minimum

2. At full-white pattern (ABL is working): 30Ft-L Typical

All above is based on the conditions that brightness control, and contrast are set at maximum position.

Contrast Adjustment Range

As contrast control is set at maximum level, adjusting Brightness control from minimum to maximum position, the light output of 3" block pattern shall be increased more than 20Ft-L. If adjusts brightness control to minimum position, the 3" block pattern shall be extinguished when contrast is set also to minimum.

Linearity (set to 20Ft-L at full white pattern first) at crosshatch pattern.

1. Vertical Non-linearity: 7% maximum

2. Horizontal Non-linearity: 10% maximum

Geometric Distortion (with 20FT-L at full white pattern)

1.	Top/Bottom Pincushion	2.0 mm maximum
2.	Side Pincushion:	2.0 mm maximum
3.	Top/Bottom Barreling:	2.0 mm maximum
4.	Side Barreling:	2.0 mm maximum
5.	Vertical Trapezoid:	2.5 mm maximum
6.	Horizontal Trapezoid	2.5 mm maximum
7.	Tilt:	1.0 mm maximum
8.	Orthogonal	2.0 mm maximum
9.	Picture Centering:	4.0 mm maximum

Size Stability

Picture growth from 5Ft-L to maximum Ft-L shall be less than 4 mm with full white pattern (double side)

Swing and Jitter

Swing and Jitter are not permitted in the conditions stated as follows: (the distance of viewing is 30 cm from eyes to screen)

1. AC power input fluctuates from 90Vac to 264 Vac, 50Hz or 60 Hz

2. Brightness and contrast VRs change from maximum to minimum or vice versa

Focus (The distance of viewing is 30 cm from eyes to screen)

Under the condition of luminance of 20Ft-L at full white pattern, Brightness VR is set to the degree when the raster is about to disappear, and contrast VR is set at maximum. all # characters on the screen must be clear.

Address	Data	Description	Defined By
28 29	00 00	#2	OQI
2A 2B	00 00	#3	OQI
2C 2D	00 00	#4	OQI
2E 2F	00 00	#5	OQI
30 31	00 00	#6	OQI
32 33	00 00	#7	OQI
34 35	00 00	#8	OQI
36 37 38 39 3A 3B 3C 3D 3E 3F 40 41 42 43 44 45 46 47		Detailed Timing Description # 1 use 0 if n/a	OQI
48 49 4A 4B 4C 4D		Detailed Timing Description # 2 use 0 if n/a	OQI

Address	Data	Description	Defined By
4E		Detailed Timing Description # 2	
4F			
50		use 0 if n/a	OQI
51			
52			
53			
54			
55			
56			
57			
58			
59			
5A		Detailed Timing Description # 3	
5B			
5C		use 0 if n/a	
5D			
5E			
5F			
60			
61			
62			
63			OQI
64			
65			
66			
67			
68			
69			
6A			
6B			
6C		Detailed Timing Description # 4	
6D			
6E		use 0 if n/a	
6F			
70			OQI
71			
72			
73			
74			
75			
76			

Address	Data	Description	Defined By
77			
78			
79			
7A			
7B			
7C			
7D			
7E	00	Extension Flag	
7F		Check sum	**OQI**

Note : Don't care address data : ID Serial Number (0C~0F) , Date Code (10~11) and Check sum (7F).

Note 1

Bit	Bit Description
7	Analog / Digital Signal Level
6	Signal Level Standard (6)
5	Signal Level Standard (5)
4	Setup
3	Sync Inputs Supported (3)
2	Sync Inputs Supported (2)
1	Sync Inputs Supported (1)
0	Sync Inputs Supported (0)

Bit	Description
7	Analog / Digital Input : Defines usage of the rest of the byte as "analog input" or "digital" input. Analog=1. If input is described as analog, the following definetions apply to bits 6-0. Digital is as yet undefined in the following but provisions have been made in anticipation of a common video output standard for Flat Panel Display (FPD) use.
6,5	Signal Level Standard (6,5) : Refer to the following bit definitions. Identified by the level of reference white volts above blank, followed by the level of the sync tips in volts below blank. Bit 6 Bit 5 Operation 0 0 0.700V/0.300V (1.000V p-p) 0 1 0.714V/0.286V (1.000V p-p) 1 0 1.000V/0.400V (1.400V p-p) 1 1 Reserved, TBD

Bit	Description	
4	Setup: If set, the display is set to expect a blank-to black setup or pedestal per the appropriate signal level standard.	
3:0	Sync Inputs (See Bit Operation below)	
	3	Separate Sync
	2	Composite Sync (on H Sync line)
	1	Sync on Green Video
	0	Serration of the V.Sync Pulse is required when composite sync or sync-on-green video is used

Note 2

Bit 7	Stand-by
Bit 6	Suspend
Bit 5	Active off
Bit 4:3	Display Type
	0,0 - Monochrome/gray scale display 0,1 - RGB color display 1,0 - Non-RGB multicolor display (example:RGY) 1,1 - Undefined
Bit 2:0	Reserved. Set at 00h until defined.

Note 3

Fill in a form:

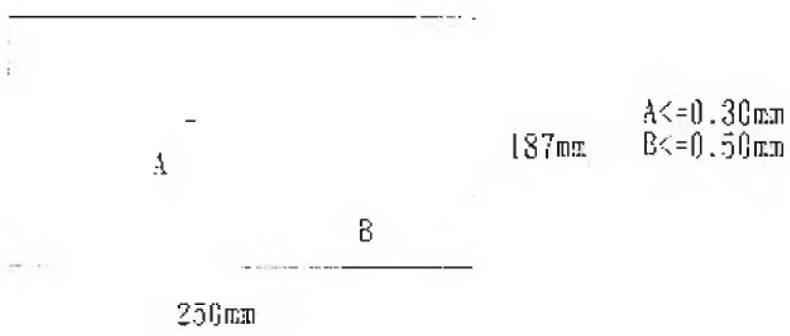
CRT Vender	Red (x/y)	Green (x/y)	Blue (x/y)	Gamma

1.3.2 Color Quality

Misconvergence

Use "crosshatch" white pattern, then set the brightness VR until the raster disappear, and set contrast VR to its maximum to examine the convergence.

The misconvergence must strictly meet the requirements stated as follows:



Moire(The distance of watch is 30 cm from eyes to screen)

In the pattern of all green, all blue, all red, or all white, and the luminance is higher than 18Ft-L, moire is not allowed to appear.

Impurity

Impurity should not appear in the pattern of all green, all blue or all red, white, the brightness is 0-max Ft-L and the screen display is set to East direction.

White Balance

At the condition of all white pattern, X=0.281, Y=0.311, white is required to meet the following specifications when brightness VR is set at the raster disappear and contrast VR changed at 3" block pattern:

40 Ft-L = X, Y variety value < 10%
20 Ft-L = X, Y variety value < 10%
5 Ft-L = X, Y variety value < 20%

Uniformity

When the display unit is displayed with mosaic pattern at the central brightness of 20 Ft-L, the corners (A,B,C,D) brightness must be > 12Ft-L

A		B	50mm
	20Ft-L		87mm
C		D	50mm
60mm	130mm	60mm	

A,B,C,D > 12Ft-L

Indicator of Testing Positions

Degaussing

Degaussing occurs automatically when the monitor is turned on and is sufficient to demagnetize the CRT to any possible change in the Earth's magnetic field from movement or shipment. It should be cooled down at least 20 minutes before power on

1.3.3 Controls and Presetting

User Controls (Under the front panel)

1. Power-On/Off switch - rocker switch
2. Brightness
3. Contrast
4. Vertical Center
5. Horizontal phase - with detent
6. Horizontal phase - with detent
7. Vertical size - with detent

Presetting

When all external controls of H-size, H-phase and V-size are set at detent position, all the following three modes are preset by internal controls to set them at the right size and position

1. VGA mode
2. VESA (640 x 480) mode at 37.8KHz
3. SVGA (800 x 600) mode at 37.8KHz
4. SVGA (800 x 600) mode at 48.09KHz
5. SVGA (800 x 600) mode at 46.88KHz
6. UVGA (1024 x 768), non-interlaced at 48.363KHz

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When the display unit is displayed with mosaic pattern at the central brightness of 20 Ft-L, the corners (A,B,C,D) brightness must be > 12Ft-L

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6. UVGA (1024 x 768), non-interlaced at 48.363KHz

1.4 Physical Specifications

1.4.1 Physical Dimension and Appearance

Overall Dimensions	356 mm (W) x 348 mm (H) x 380 mm (D)
Net Weight	11.3 kg
Outer Appearance	See Figure 6 and Figure 7

1.4.2 Construction and Materials on Outer Surface

Materials	Plastic
Color	Light gray (To be Defined by OEM)

1.4.3 Base and Swivel

Tilt	-5/+15 degrees
Swivel	-45/+45 degrees

1.4.4 Marking and Labels

Reference and Labels (Rear Panel)	Reference Numbers
	Manufacture data
	Agency Approvals
	Power Ratings
Controls and Connectors	AC power cord input: abbreviated labels
	User's controls: standard print

1.4.5 Packaging

Carton Dimension	487mm (L) x 458mm (W) x 408mm (H)
Shipping Weight	13.2 kg

Chapter 2

Alignment Procedure

2.1 Preparation for Alignment

2.1.1 Equipment and Tools Required

Standard Test Equipment	Voltmeter
	Dual trace oscilloscope
	High voltage probe
	Hand tools as required
	Color analyzer, Minolta TV2150 or equivalent
	Computer with Acer 8215 card or equivalent

2.1.2 Starting Procedure

1. Pre-set, counter-clockwise to maximum, all VRs to the center position, except R/G/B bias VR105, 106, & 107.

2. Set up the unit and warm it up for at least 30 minutes.

3. The signal mode is 31/37/48KHz.

Mode	Frequency (H/V)	Display
1	31.47K (-/-)	640 x 350 (VGA1)
2	31.47K (-/-)	640 x 400 (VGA1)
3	31.47K (-/-)	640 x 480 (VGA1)
4	37.86K (-/-)	640 x 480 (VGA2)
5	37.879K (-/-)	800 x 600 (SVGA2)
6	48.09K (-/-)	800 x 600 (SVGA3)
7	46.88K	800 x 600 (SVGA4)
8	48.37K (-/-)	1024 x 768 (UVGA1)

2.2 B+ Adjustment

1. Input mode 48KHz (UVGA1 1024 x 768) with cross hatch pattern.

2. Set brightness and contrast keys to maximum.

3. Adjust switching power supply VR601 to make video B+ 147 ± 0.5 VDC.

2.3 H-Hold Adjustment

1. Input mode 31 KHz (VGA1 640 x 400) with full white pattern.
2. Short TP3 to the nearest ground
3. Adjust VR253 (H-Hold) to make sure the picture almost stands up. then remove the short wire and make sure that the pitch is stable.

2.4 Geometry Adjustment

1. Input mode 31KHz (VGA1 640 x 400) with full white pattern.
2. Set external contrast VR to maximum position.
3. Set external brightness VR to raster's just cut off position.
4. Set external H-size, H-phase, V-size, and V-center VRs to the center position.
5. Adjust VR256 (internal H-phase VR)to center the horizontal phase.
6. Adjust VR250 (pincushion VR) to meet pincushion specification.
7. Adjust VR302 (internal H-size VR) to meet horizontal size specification.
8. Adjust VR252 (internal V-size VR) to meet vertical size specification
9. Check performances of all modes

2.5 Background Adjustment

1. Input mode 31 KHz (VGA1 640 x 400) with background pattern.
2. Set external contrast and brightness VRs to maximum position.
3. Check whether the bias VRs of VR105, 106 and 107, are at counter-clockwise maximum position
4. Adjust screen VR of FBT to obtain twilight raster about 1 to 1.5Ft-L.
5. See which gun appears first, then adjust the two bias VRs of the other two non-appearing guns to achieve the color temperature meet specifications: x=0.281 +/- 0.005; y=0.311 +/- 0.005.
6. Adjust screen VR of FBT again to let the raster about 1 to 105 Ft-L.

2.6 Foreground Adjustment

1. Input mode 31KHs (VGA1 640 x400) with 3" block pattern.
2. Set external contrast VR to maximum position.
3. Set external brightness VR to maximum position.
4. Check whether the drive VRs of VR103, 104, and sub-contrast VR306 are at center position.
5. Adjust sub-contrast VR306 to let the light output become 70 Ft-L.
6. Set external brightness VR to minimum position.
7. Adjust contrast VR to let the light output become 15 Ft-L, then adjust VR103 and 104 to let the color temperature meet the specifications: x = 0.281 +/- 0.003; y=0.311 +/- 0.003.
8. Set contrast VR to maximum, then re-adjust VR306 to let the light output become 70 +/- 2 Ft-L.

2.7 ABL Adjustment

1. Input mode 31KHz (VGA1 640 x 400) with full white pattern.
2. Set external contrast and brightness VRs to maximum position.
3. Check whether the ABL VR305 is at the center position.
4. Adjust ABL VR305 to let the light output become 30 +/- 2 Ft-L

2.8 Power Saving Function Check

1. Input mode 31KHz (VGA1 640 x 400) with full white pattern.
2. Set external contrast and brightness VRs to maximum position.
3. Remove H-Sync, the video and raster should be extinguished The power consumption is around 55W
4. Remove V-Sync, the power consumption should be less then 5W and LED flashes.
5. Input H-Sync and V-Sync, the video should be exhibited again and LED is on.

2.9 Focus Adjustment

1. Input mode 48KHz (SVGA3 800 x 600) with "Reverse Character Pattern" Windows Application).
2. Set external contrast VR to maximum position.
3. Set external brightness VR to raster just cut off position.
4. Adjust focus VR of FBT to make the video area focus clearer.

2.10 Convergence Adjustment

1. Input mode 31KHz (VGA1 640 x 400) with cross hatch pattern.
2. Adjust 4-pole and 6-pole of Yoke to meet the specification.

2.11 Geometry Specification

Item	Description	Specification
1	Hori Size	250± 4 mm
2	Vert Size	187± 4 mm
3	Side Pin	≦ 2.0 mm
4	Top/Bottom Pin	≦ 2.0 mm
5	Side Barrel	≦ 2.0 mm
6	Top/Bottom Barrel	≦ 2.0 mm
7	Trapezoid	≦ 2.5 mm
8	Video Offset	≦ 4.0 mm
9	Parallelogram	≦ 2.5 mm

2.12 The DDC data file overview :

```
00 FF FF FF FF FF FF 00    --
06 94 55 71 00 00 00 00     |
00 00 01 00 0C 1C 15 A0     |
68 02 B2 A0 57 45 99 26     |
19 48 4F A7 52 00 00 00     '
00 00 00 00 00 00 00 00     |
00 00 00 00 00 00 00 00     |
00 00 00 00 00 00 00 00     |  DDC 128 byte data
00 00 00 00 00 00 00 00     |
00 00 00 00 00 00 00 00     |
00 00 00 00 00 00 00 00     |
00 00 00 00 00 00 00 00     :
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00     :
00 00 00 00 00 00 00 00     |
00 00 00 00 00 00 00 00     |
00 00 00 00 00 00 00 00     --
7                  ----------> serial number mode
XXX                ----------> manufacture name description--
1000S              ----------> product name description
```

VSC ViewSonic

OQI Optiquest

serial number mode :

1. serial number mode value > 0 :

EX: serial number mode = 7

M54T0000001

Last 7 digit serial number is valid.

2. serial number mode =0 :

Aywwxxxxx

A : Alphanumeric

y : year of manufacture

ww: week number of manufacture

xxxxx : serial number

2.13 DDC writer & DDC1/DDC2 data verify program

1. at DOS prompt enter writer file name .
   EX:DDCPDI

2. Input mode screen :

```
*************************************************************
*                    Write data to 24LC21                   *
*                                                           *
*          (C)Copyright Acer Peripherals,Inc  1994          *
*************************************************************

-------------------------------------------------------------

  Input data file name : *.ddc  ---> enter data file name

 -------------------------------------------------------------

  00 : 00 FF FF FF FF FF FF 00 - 06 09 76 71 00 00 00 00
  01 : 00 00 01 00 00 1C 15 A0 - 68 02 32 A0 57 49 99 26
  02 : 10 48 4F A7 52 00 00 00 - 00 00 00 00 00 00 00 00
  03 : 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
  04 : 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
  05 : 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
  06 : 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
  07 : 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00

  Serial number format : X digit
  Manufacturer Name    : XXX
  Product code         : 1000S

-----------------------------------------

  Input current date ===> Year (19xx):1995   --------> Input year
                          Month :1           --------> Input month
  Year : 1995    month : 1    week : 3       --------> show date
                  Date code modify ? (Y/N)   --------> input
```

3. Write screen :

```
                Display Data Channel (DDC) Writer
              (C)Copyright Acer Peripherals,Inc.1994


Date       : 1995 - 3

                                    Data file : XXXXX.ddc
                                     Bar code number : M54T0000001

                                          (Input serial number)

                                                    *Note 1
```

Power turn off ----> turn on ----> press any key

Note 1 : If serial number is blank space,the value is 0000000

4. Message screen

```
                Display Data Channel (DDC) Writer
            (C)Copyright Acer Peripherals,Inc  1994

Command :                                        Date      : 1995 - 3
     F  : Change data file                        Data file : XXXXX.cdc
     D  : Change data                  Bar code number   : M54T0000001
    Esc : Quit                         Manufacturer name : XXX
                                       Product code      : 1000S
     **********************            Serial number     : 0000001
     *         PASS         *
     **********************

      00 : 00 FF FF FF FF FF FF 00 - 06 09 76 71 01 00 00 00
      01 : 03 05 01 00 05 1C 15 A0 - 68 02 B2 A0 57 49 9A 26
      02 : 10 48 4F A7 52 00 00 00 - 00 00 00 00 00 00 00 00
      03 : 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
      04 : 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
      05 : 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
      06 : 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
      07 : 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00

           Press any key to continue.....
```

DDC Test Tools:

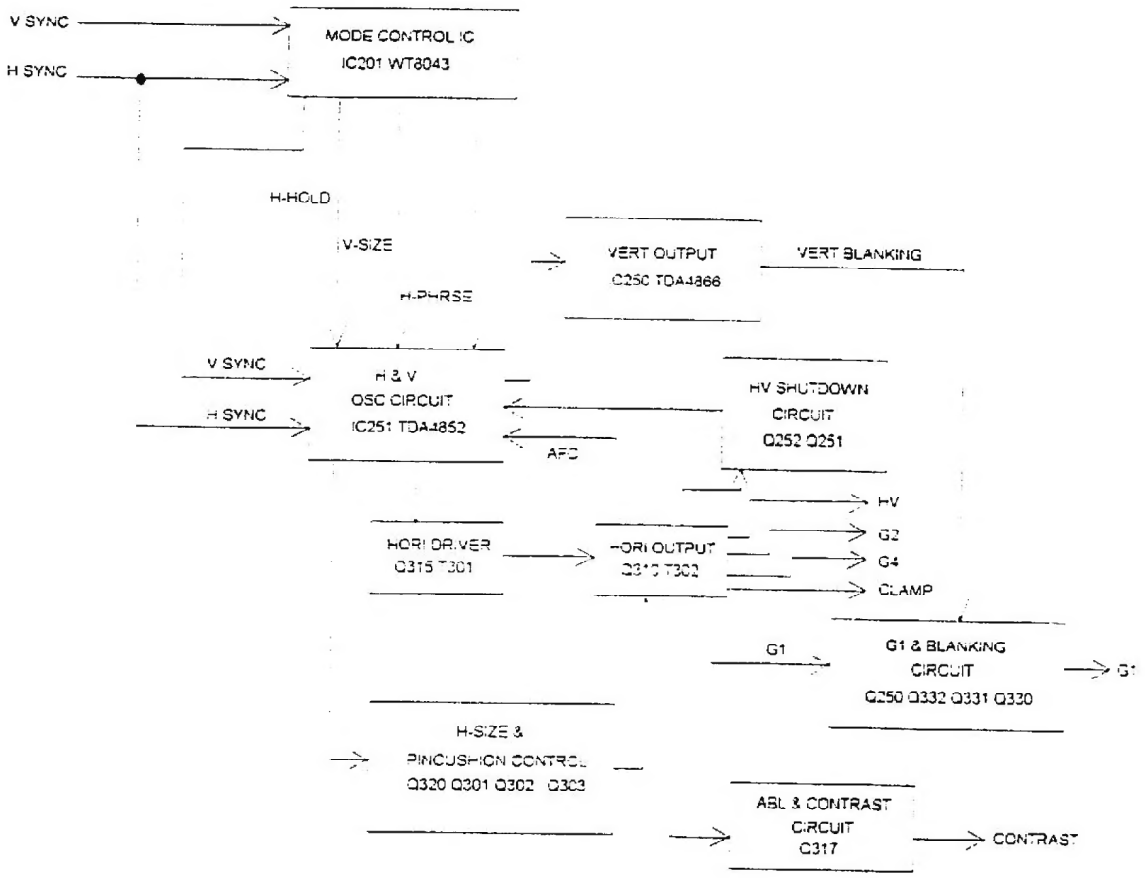
1. 8255 card
2. Program file & data file

Chapter 3

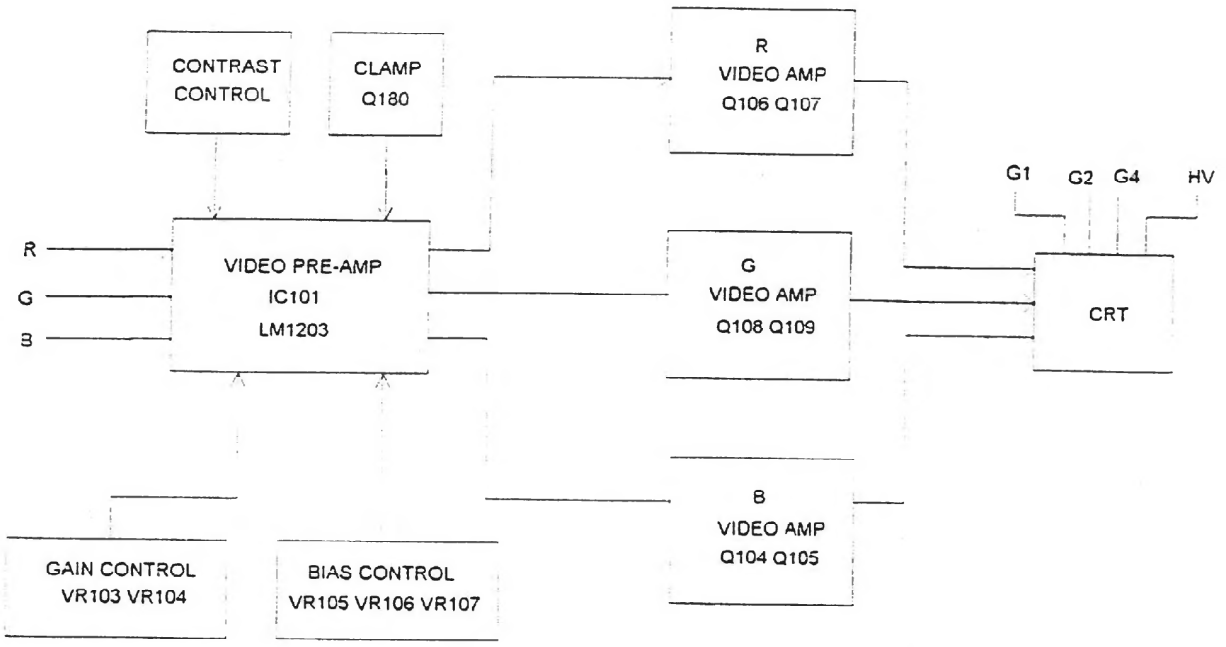
Circuit Operation Theory

3.1 Block Diagram

Deflection CKT Block Diagram



Video CKT Block



SMPS CKT Block Diagram

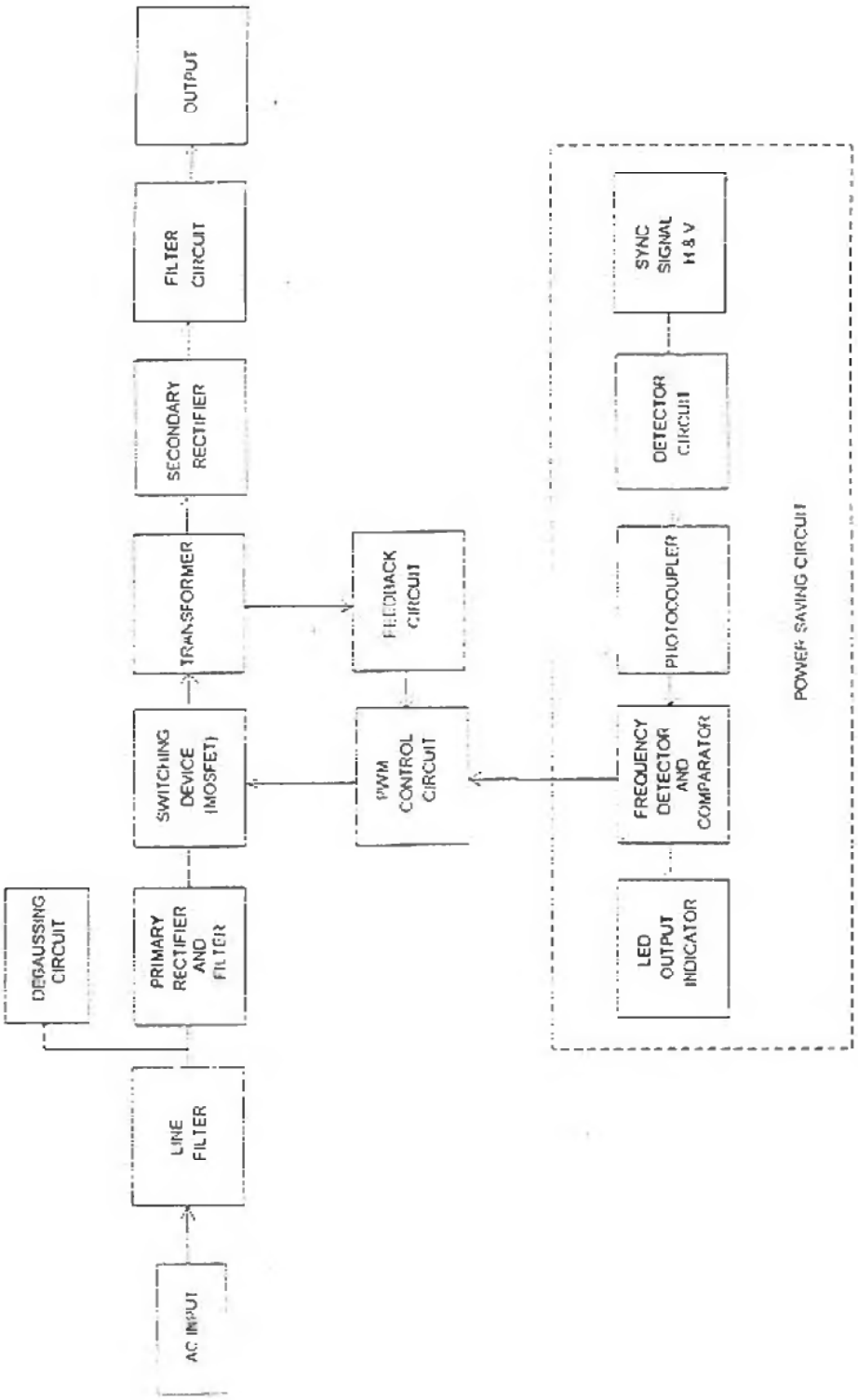


Fig.2.12

3.2 Mode Control Circuit

1. IC201 WT8043 is used for mode control. We can use it to detect the following timing:

Mode	Frequency (H/V)	Resolution
1	31.47K (+/-)	640 x 350 (IBM VGA)
2	31.47K (-/+)	640 x 400 (IBM VGA)
3	31.47K (-/-)	640 x 480 (IBM VGA)
4	37.86K (+/-)	640 x 350 (VESA VGA)
5	37.86K (-/+)	640 x 400 (VESA VGA)
6	37.5K (-/-)	640 x 480 (VESA VGA)
7	37.879K (+/+)	800 x 600 (SVGA2)
8	48.09K(+/+)	800 x 600 (SVGA3)
9	46.88K(+/+)	800 x 600 (SVGA4)
10	48.37K (-/-)	1024 x 768 (UVGA)

2. Pinout of WT8043

Pin No	Description
1	Oscillation in
2	Oscillation out
3	Horizontal Sync Input
4	Vertical Sync Input
5	Horizontal Sync Output
6	Vertical Sync Output
7	F45K - active low when the horizontal frequency is greater than 45KHz
8	F36K - active low when the horizontal frequency is greater than 36KHz
9	Ground
10	F33K - active low when the horizontal frequency is greater than 33KHz
11	Active low in 31KHz and 37KHz 640 x 350
12	Active low in 31KHz and 37KHz 640 x 400
13	Active low in 31KHz and 37KHz 640 x 480
14	Active low in 37KHz 800 x 600
15	Active low in 46KHz 800 x 600
16	Active low in 48KHz 800 x 600
17	Active low in 48KHz 1024 x 768
18	No connection
19	VCC + 5VDC

3. Horizontal Phase Preset

- R202 is for 48Khz 1024 x 768 horizontal phase preset.
- R204 is for 46Khz 800 x 600 horizontal phase preset.
- R205 is for 37Khz 800 x 600 horizontal phase preset.
- R206 is for 31Khz IBM VGA horizontal phase preset.
- R207 is for 37Khz VESA VGA horizontal phase preset.

4. Vertical Size Preset

- R210 is for 48Khz 1024 x 768 vertical size preset.
- R211 is for 48Khz 800 x 600 vertical size preset.
- R214 is for 31Khz 640 x 480 IBM VGA vertical size preset.
- R215 is for 31Khz 640 x 400 IBM VGA vertical size preset.
- R216 is for 31Khz 640 x 350 IBM VGA vertical size preset.
- R217 is for 37Khz 640 x 480 VESA VGA vertical size preset.
- R218 is for 37Khz 640 x 400 VESA VGA vertical size preset.
- R219 is for 37Khz 640 x 350 VESA VGA vertical size preset.
- R212 is for 46Khz 800 x 600 SVGA4 vertical size preset.
- R213 is for 37Khz 800 x 600 SVGA2 vertical size preset.

5. Horizontal Size Preset

- R228 is for 48Khz 1024 x 768 horizontal size preset.
- R241 is for 37Khz 800 x 600 horizontal size preset.
- R242 is for 31Khz IBM VGA horizontal size preset.
- R245 is for 37Khz VESA VGA horizontal size preset.

6. Since WT8043 can not distinguish 31Khz and 37Khz VGA, use Q205, Q202, Q202, Q201, and Q208 to distinguish 31Khz IBMVGA and 37Khz VESA VGA.

7. Q204, Q206, Q207 sends control signals F45A, F36A, F33A to control the switching power supply. In this way, the switching power supply can send the correct horizontal B+ to FBT.

8. Q201 and R236 are used for 48Khz, 800 x 600 vertical center compensation.

9. From R220 to R227 and R230 to R232 are used for pull-up resistors.

10. Truth Table for WT8043

Hs Frequency	F33K	F36K	F45K
Hs < 33Khz	1	1	1
33Khz < Hs < 36Khz	0	1	1
36Khz < Hs < 45Khz	0	0	1
45Khz < Hs	0	0	0

3.3 Horizontal and Vertical Oscillation Circuit

1. IC251 TDA4852 merges the horizontal oscillation stage and vertical oscillation stage.

2. The IC251 TDA4852 Pin Assignment:

Pin Number	Description
1	VCC +12VDC
2	AFC and HV shutdown
3	Horizontal oscillation output
4	Ground
5	Vertical oscillation output 1
6	Vertical oscillation output 2
7	Ground
8	No connection
9	Horizontal sync input from M301
10	Vertical sync input from IC201 pin 6
11	Parabolic waveform output for pin cushion compensation
12	Capacitor for amplitude control
13	Vertical size control
14	Pin cushion control
15	Vertical oscillator resistor
16	Vertical oscillator capacitor
17	PLL1 phase
18	Horizontal hold control
19	Horizontal oscillator capacitor
20	PLL2 phase. Horizontal phase control

3. Q253 reduces the horizontal jitter.

4. Horizontal Hold Control

- VR253 is for 31Khz horizontal hold preset.
- R266 is for 35Khz horizontal hold preset.
- VR260 is for 37Khz horizontal hold preset.
- VR264 is for 48Khz horizontal hold preset.

5. Pin cushion Control

VR250 is for 31Khz pincushion preset.
R267 is for 35Khz pincushion preset.
R261 is for 37Khz pincushion preset.
R262 is for 48Khz pincushion preset.
R298 is for 31Khz and 37Khz 640 x 350 pincushion preset.

6. R255 makes the vertical linearity correct

7. R252 can make the compensation for pin cushion when vertical size is adjusted.

3.4 Vertical Output Circuit

1. IC250 TDA4866 is used for vertical output amplifier.

2. The IC250 TDA4866 Pin Assignment:

Pin Number	Description
1	Vertical oscillation input 1
2	Vertical oscillation input 2
3	VCC +12VDC
4	Vertical output V-
5	Ground
6	Vertical output V+
7	Flyback supply voltage +40VDC
8	Vertical blanking pulse
9	Feedback input

3. Q250 sends the vertical blanking pulse to G1.

4. VR254 is used for vertical center control.

3.5 H.V. Shut Down Control

Q252 and Q251 are used for HV shutdown circuit. When HV is greater then 27KV, the voltage of FBT pin 9 (+40V) turns on ZD250. Q251 and Q252 are also turned on. IC251 TDA4852 pin 2 gets a high level voltage to terminate the horizontal oscillator.

3.6 Horizontal Output Circuit

1. Q315 and T301 are used for horizontal driver.

2. The "Diode Modulation Structure" is used for the horizontal output circuit.

3.

- Q310 is horizontal output transistor.
- L302 is Linear coil.
- C312 and C311 are Cs capacitors.
- D307 and D308 are damper diodes.
- C314 and C315 are tuning capacitors.
- L303 is the modulating coil.

4. D306, D309, R319, R320, R321, R325, C308, C317 are used as a snubber circuit. It reduces the surge voltage during mode change to prevent Q310 from damage.

5. Q311 and Q314 turn off C311 when horizontal frequency is greater than 45Khz.

6. Q320 and Q301 are used as amplifiers for parabolic waveform. Q302 and Q303 merge the parabolic waveform of pin cushion and DC level of horizontal size control. It is used for "Diode Modulation" control.

7. B+ is 90VDC in 31Khz, 103VDC in 35Khz, 113VDC in 37Khz, 147VDC in 48Khz.

3.7 Spot Killer and Blanking Circuit

1. Spot Killer - when power is turned off, the residual electronic beam from the CRT burns the CRT phosphor. So it is necessary to make G1 more negative when power is turned off to stop the emission of the CRT electronic beam.

2. When power is on, +6.3VDC turns on Q332. G1 voltage is around -30VDC. When power is off, +6.3VDC goes to 0VDC. It turns off Q332. G1 voltage goes to -180VDC to stop beam emission.

3. Blanking - vertical blanking signal comes from pin 8 of IC250 TDA4866. Q250 makes the signal go reverse and higher then coupling to G1. There will be no vertical retrace lines visible.

3.8 Power Saving

1. When the user does not make use the PC. the PC makes the monitor go into "Power Saving Mode". The PC must have power management program.

2. There are four power saving modes:

Mode	Description
Standby Mode	PC removes the horizontal sync. In this mode. Q331 is turned off. It turns off Q332 at the same time. G1 goes to -180VDC. There is no video and raster shown on the screen. The monitor power consumptionis about 55W.
Suspend Mode	PC removes the vertical sync. In this mode. the switching power supply is shutdown. The power consumption of the monitor is less than 5W.
Off Mode	PC removes the horizontal and vertical sync. In this mode. the switching power supply is shut down. The monitor power consumption is less than 5W.
Burn-in Mode	When the signal connector is connected to the PC. the "EPS1" is shorted to the ground on the PC side. Q330 is turned off. When the signal connector is disconnected from the PC. the "EPS1" is floated. It turns on the Q330. In this mode. Q332 is always on. even without horizontal sync. We can see the raster on the screen

NOTE: *There is no CRT heater pre-heat in suspend mode. The suspend mode and off mode are combined.*

3.9 ABL (Auto Brightness Limit) Circuit

1. When the brightness is increased. the CRT beam current goes high. The beam current should not exceed 350 uA. It is necessary to limit the beam current to keep the CRT life longer.

2. When the brightness is increased, the CRT beam current goes high. The R350 and VR305 currents go high too. It creates more voltage drops on the resistors so the Q317 base voltage goes lower. It turns on Q317. The Q317 emitter is connected to the video contrast control. At this time. the contrast voltage is pulled down. The beam current is limited.

3. To change the ABL working point. it needs to adjust VR305. With full white pattern. it is recommended to adjust to 30Ft-L.

3.10 Video Amplifier Circuit

1. The process circuit of R. G. B are the same.

2. VR103 is used for video gain control. VR107 is used to cut off voltage control.

3. The cascade amplifier circuit is composed or Q104 and Q105.

3.11 Switching Power Supply

The main purpose of the EMI filter is to reduce the conducted noise. There are two major aspects of conducted interference to be considered: the differential mode conducted noise and the common mode conducted noise.
The EMI filter consists of L601, C602, L602, C603, C604, and L603.

The input rectifier/filter converts the 47 - 63 Hz AC line voltage to a DC voltage.

The input rectifiers are configured as a full wave bridge.

Input CKT is universal such that the input voltage is from 90Vac to 264 Vac and input frequency is from 47Hz to 63Hz. When the input voltage equals 90 Vac, input current equals 0.9A or input voltage eqials 264Vac, input current equals 0.5A.

The switching device of power supply is MOSFET 2sk793. The maximum rating is Ids = 5A. Vds = 850V and PWM current mode controller is UC3842. The pin functions are as follows:

Pin Number	Function	Pin Number	Function
1	Error amplifier output	5	GND
2	Negative feedback	6	Output
3	Current sensor	7	Vcc
4	Sawtooth ramp oscillator	8	Vref = 5V

The 1000S power supply output is as follows:

6.3V: 0.7A
12V: 0.7A
90V: 0.55A (Fh = 31.4Khz)
113V: 0.4A (Fh = 37Khz)
147V: 0.35A (Fh = 48khz)

The power supply adds a snubber CKT to reduce the spike of MOSFET Vds which results from the leakage of the transformer.

The snubber CKT consists of R605, C606, C607, D606.

The pin 6 output of UC3842 drives the gate of power MOS 2SK793, so the transformer primary winding comes into oscillatory square wave so as to store and transfer energy.

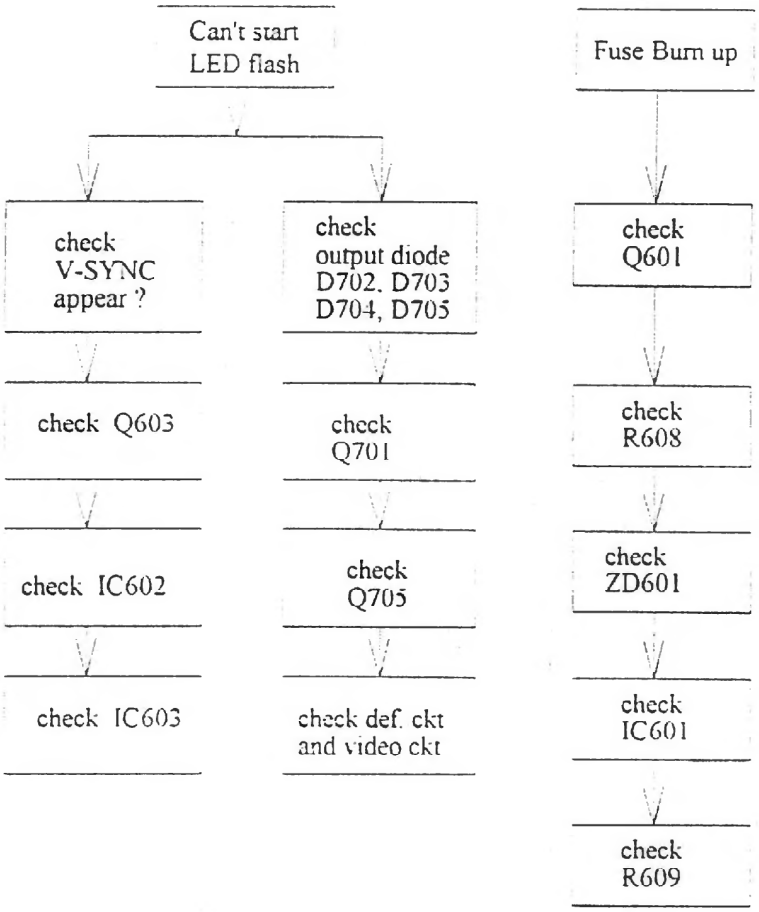
When MOSFET 2SK793 turns off, the secondary output diodes turn on and the secondary winding flux energy transfer to capacitor to supply load. Secondary connects the L.C. low pass filter in order to reduce ripple and noise.

There is power saving function in the switching power supply. When V-Sync appears, it is detected by an optocoupler through LM393 comparator, then UC3842 during normal operation. The monitor works at ON mode.

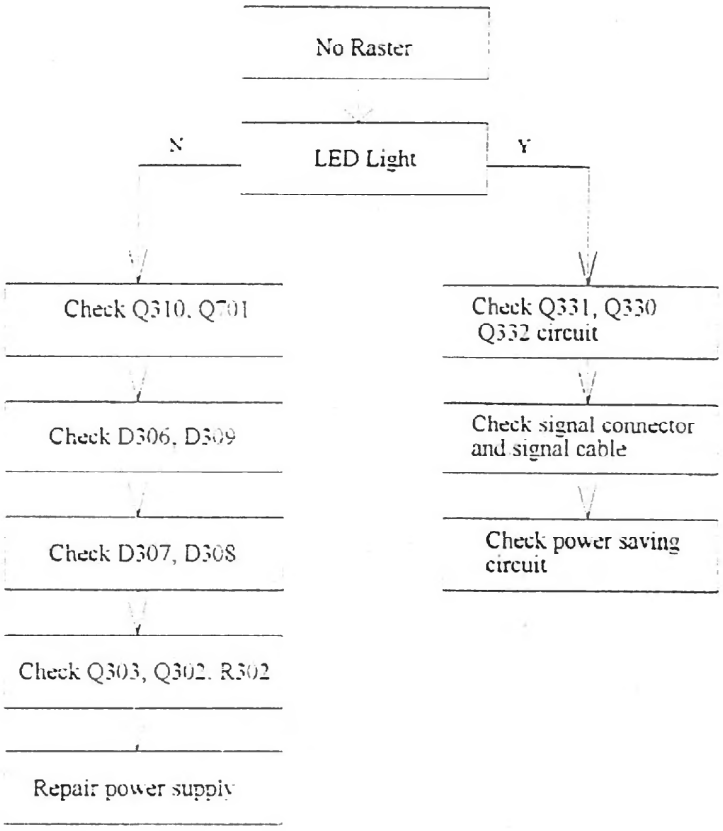
When V-Sync disappears, or V-Sync frequency is less than 10Hz, the UC3842 shuts down and the power supply does not output, then the monitor works at suspend mode (off mode) and the power loses are less than 5W to achieve power saving function.

Trouble Shooting Guide

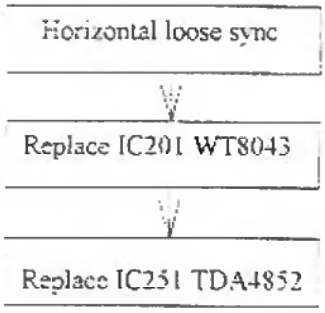
3.12.1 SPS Trouble shooting



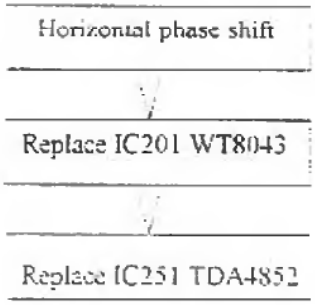
3.12.2. No Raster



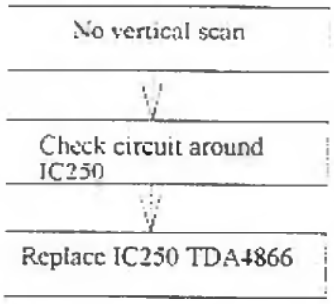
3.12.3. Horizontal loose sync :



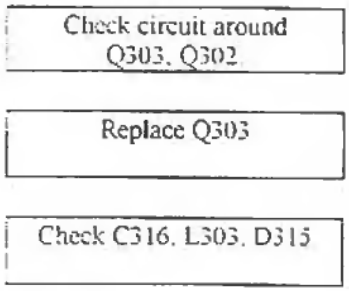
3.12.4. Horizontal phase shift :



3.12.5. No Vertical Scan :



3.12.6. Horizontal Size and Pin Cushion Poor :

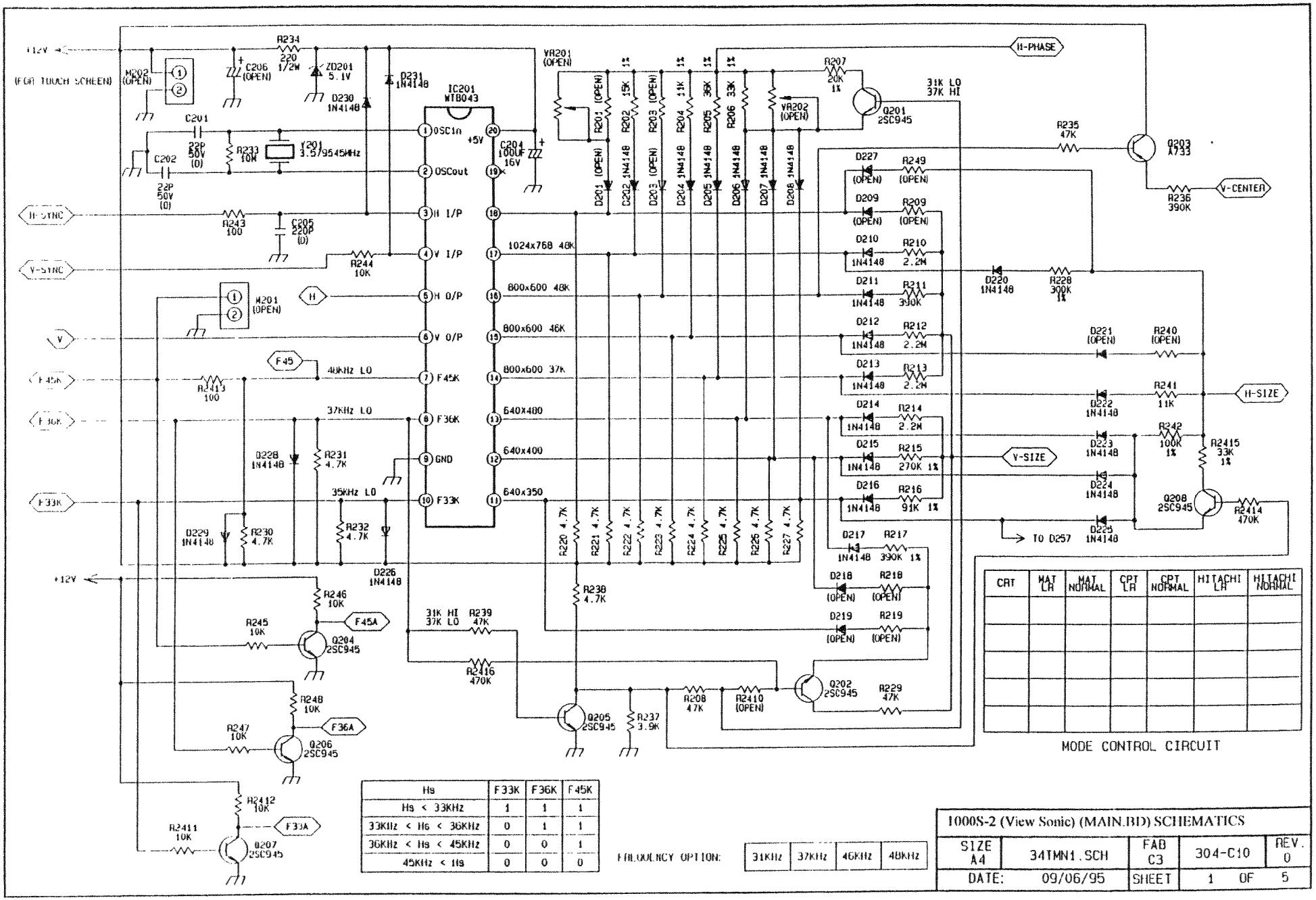


1000S-2 DDC VARIANCE LIST FOR DIFFERENT MAIN BOARDS

NO	LOCATION	HIT LR 55.75401.151	CPT LR 55.75401.211	MAT LR 55.75401.191	SAM LR 55.75401.301	MAT NORMAL 55.75401.221	CPT NORMAL 55.75401.101	HIT NORMAL 55.75401.201	HIT LR S 55.75401.321	MAT NORMAL S 55.75401.311
1	R205	14.33025.012 33K	14.36025.012 36K	14.36025.012 36K	14.56025.012 56K	14.36025.012 36K	14.36025.012 36K	14.36025.012 36K	14.33025.012 33K	14.36025.012 36K
2	R204	14.11025.012 11K	14.11025.012 11K	14.11025.012 11K	14.14025.012 14K	14.11025.012 11K	14.11025.012 11K	14.11025.012 11K	14.11025.012 11K	14.11025.012 11K
3	R202	14.15025.012 15K	14.15025.012 15K	14.15025.012 15K	14.18025.012 18K	14.15025.012 15K	14.15025.012 15K	14.15025.012 15K	14.15025.012 15K	14.15025.012 15K
4	R240	14.15015.012 15K	14.15015.012 15K	14.15015.012 15K	14.15015.012 15K	14.33015.012 3.3K	14.15015.012 15K	14.15015.012 15K	14.15015.012 15K	14.33015.012 3.3K
5	R241	14.33015.012 3.3K	14.15025.012 15K	14.33015.012 3.3K	14.11025.012 11K	14.33015.012 3.3K	14.33015.012 3.3K	14.33015.012 3.3K	14.33015.012 3.3K	14.33015.012 3.3K
6	R328	14.36025.012 36K	14.47015.012 4.7K	14.24325.012 24.3K	14.36025.012 36K	14.47015.012 4.7K	14.47015.012 4.7K	14.36025.012 36K	14.36025.012 36K	14.47015.012 4.7K
7	R207	14.20025.012 20K	14.20025.012 20K	14.20025.012 20K	14.27025.012 27K	14.20025.012 20K	14.20025.012 20K	14.20025.012 20K	14.20025.012 20K	14.20025.012 20K
8	R242	14.47025.012 47K	14.82025.012 82K	14.82025.012 82K	14.10035.012 100K	14.82025.012 82K	14.82025.012 82K	14.47025.012 47K	14.47025.012 47K	14.82025.012 82K
9	R245	14.15025.012 15K	14.47025.012 47K	14.18025.012 18K	14.33025.012 33K	14.18025.012 18K	14.47025.012 47K	14.47025.012 47K	14.15025.012 15K	14.18025.012 18K
10	C312	11.33437.06K 0.33u/400V	11.47437.06K 0.47u	11.47437.06K 0.47u	11.47437.06K 0.47u	11.47437.06K 0.47u	11.47437.06K 0.47u	11.33437.06K 0.33u/400V	11.33437.06K 0.33u/400V	11.47437.06K 0.47u
11	C315	11.82238.05E 0.082u/630V	11.82238.05E 0.082u/630V	11.10338.05E 0.01u	11.82238.05E 0.082u/630V	11.10338.05E 0.01u	11.10338.05E 0.01u	11.10338.05E 0.01u	11.82238.05E 0.082u/630V	11.10338.05E 0.01u
12	C330	09.22611..01C 22u/160V	09.22611..01C 22u/160V	09.22611..01C 22u/160V	09.22611..01C 22u/160V	OPEN	OPEN	OPEN	09.22611..01C 22u/160V	OPEN
13	D315	06.1R540.121 DIODE FAST 15DF4 400V 1.5A	06.1R540.121 DIODE FAST 15DF4 400V 1.5A	06.1R540.121 DIODE FAST 15DF4 400V 1.5A	06.1R540.121 DIODE FAST 15DF4 400V 1.5A	27.A0522.000 JUMPER WIRE	27.A0522.000 JUMPER WIRE	27.A0522.000 JUMPER WIRE	06.1R540.121 DIODE FAST 15DF4 400V 1.5A	27.A0522.000 JUMPER WIRE
14	TP5	50.75401.011 W.A 1P BRN 1015# 18 430mm	50.75401.011 W.A 1P BRN 1015# 18 430mm	50.75401.011 W.A 1P BRN 1015# 18 430mm	DELETE	OPEN	OPEN	OPEN	50.75401.011 W.A 1P BRN 1015# 18 430mm	OPEN
15	TP6	50.75401.041 750mm	50.75401.041 750mm	50.75401.041 750mm	50.75401.051 1100mm	OPEN	OPEN	OPEN	50.75401.041 750mm	OPEN
16	R279	13.15134.034 RES MOF 150J 1W RF5	13.15134.034 RES MOF 150J 1W RF5	13.15134.034 RES MOF 150J 1W RF5	13.15134.034 RES MOF 150J 1W RF5	13.15134.034 RES MOF 150J 1W RF5	13.15134.034 RES MOF 150J 1W RF5	13.15134.034 RES MOF 150J 1W RF5	13.15134.034 RES MOF 150J 1W RF5	13.15134.034 RES MOF 150J 1W RF5

17	R280	14.17015.012 RES MF 1.7K F 1/8W	14.17015.012 RES MF 1.7K F 1/8W	14.20015.012 RES MF 2K F 1/8W	14.17015.012 RES MF 1.7K F 1/8W	14.20015 RES MF F 1/8
18	R313	14.47025.012 RES MF 47K F 1/8W	14.47025.012 RES MF 47K F 1/8W	14.56025.012 RES MF 56K F 1/8W	14.47025.012 RES MF 47K F 1/8W	14.47025 RES MF 1/8W
19	VR302	500K	500K	500K	500K	1M
20	R307	330K	270K	390K	270K	390K
21	R335	13.18133.012 180Ω 1/2W	13.18133.012 180Ω 1/2W	13.18133.012 180Ω 1/2W	13.22035.071 220Ω 2W	13.18133 180Ω 1
22	C314	08.1022G.13W 1000P/500V	08.1022G.13W 1000P/500V	08.1022G.13W 1000P/500V	06.1A020.121 1.302.R338	08.1022G 1000P/5
23	P206	14.33025.012 33K	14.33025.012 33K	14.33025.012 33K	14.48025.012 48K	14.3302 33K
24	C311	11.33436.06K 0.33u/250V	11.33436.06K 0.33u/250V	11.33436.06K 0.33u/250V	11.33436.06K 0.33u/250V	11.33436 0.33u/2
25	P265	13.10431.012 100K	13.10431.012 100K	13.10431.012 100K	13.75431.012 75K	13.1043 100K
26	C301	-	-	-	-	-
27	D302	-	-	-	-	-
28	C302	-	-	-	-	-
29	CCRT Part No	HIT LR 56.05733.061 -M34KDD80 x 01(s)	CPT LR 56.05753.051 -M34ALA60 x 18	MAT LR 56.05754.011 -M34KNZ80 x 06	SAM LR 56.05754.041 -M34LA60 x 03	MAT NOI 56.0575 M34KNZ 05

2	14.17015.012 RES MF 1.7K F 1/8W	14.17015.012 RES MF 1.7K F 1/8W	14.20015.012 RES MF 2K F 1/8W
2	14.47025.012 RES MF 47K F 1/8W	14.47025.012 RES MF 47K F 1/8W	14.47025.012 RES MF 47K F 1/8W
	1M	500K	1M
	390K	330K	390K
2	13.18133.012 180Ω 1/2W	13.18133.012 180Ω 1/2W	13.18133.012 180Ω 1/2W
W	08.1022G.13W 1000P/500V	08.1022G.13W 1000P/500V	08.1022G.13W 1000P/500V
2	14.33025.012 33K	14.33025.012 33K	14.33025.012 33K
K	11.39436.06K 0.39u/250V	11.33436.06K 0.33u/250V	11.33436.06K 0.33u/250V
2	13.10431.012 100K	13.10431.012 100K	13.10431.012 100K
	-	19.40057.001 10mH	19.40057.001 10mH
	-	06.1R080.122 BYV 26D	06.1R080.122 BYV 26D
	-	08.1012A.13W 100P	08.1012A.13W 100P
L	HIT NORMAL 56.05733.021	HIT LA S 56.05754.031	MAT NORMAL S 56.05753.081
x	M34KDD50 x 02(J)	M34KDD80 x 06(5R)	M34KNZ080 x 05(s)



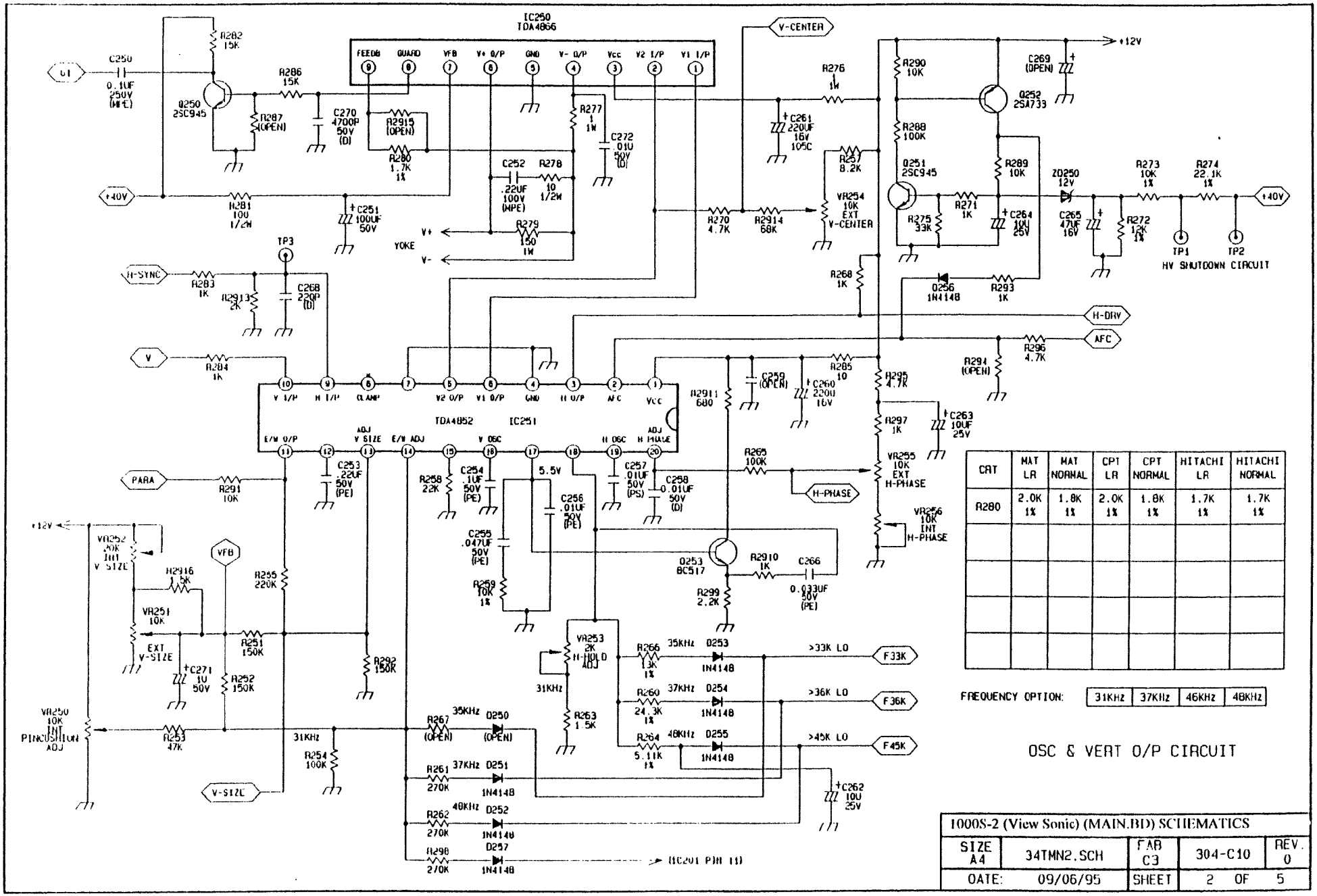
CRT	MAT LR	MAT NORMAL	CPT LR	CPT NORMAL	HITACHI LR	HITACHI NORMAL

Hs	F33K	F36K	F45K
Hs < 33KHz	1	1	1
33KHz < Hs < 36KHz	0	1	1
36KHz < Hs < 45KHz	0	0	1
45KHz < Hs	0	0	0

FREQUENCY OPTION:

31KHz	37KHz	46KHz	48KHz

SIZE		FAB		REV.
A4	34TMN1.SCH	C3	304-C10	0
DATE:	09/06/95	SHEET	1 OF 5	

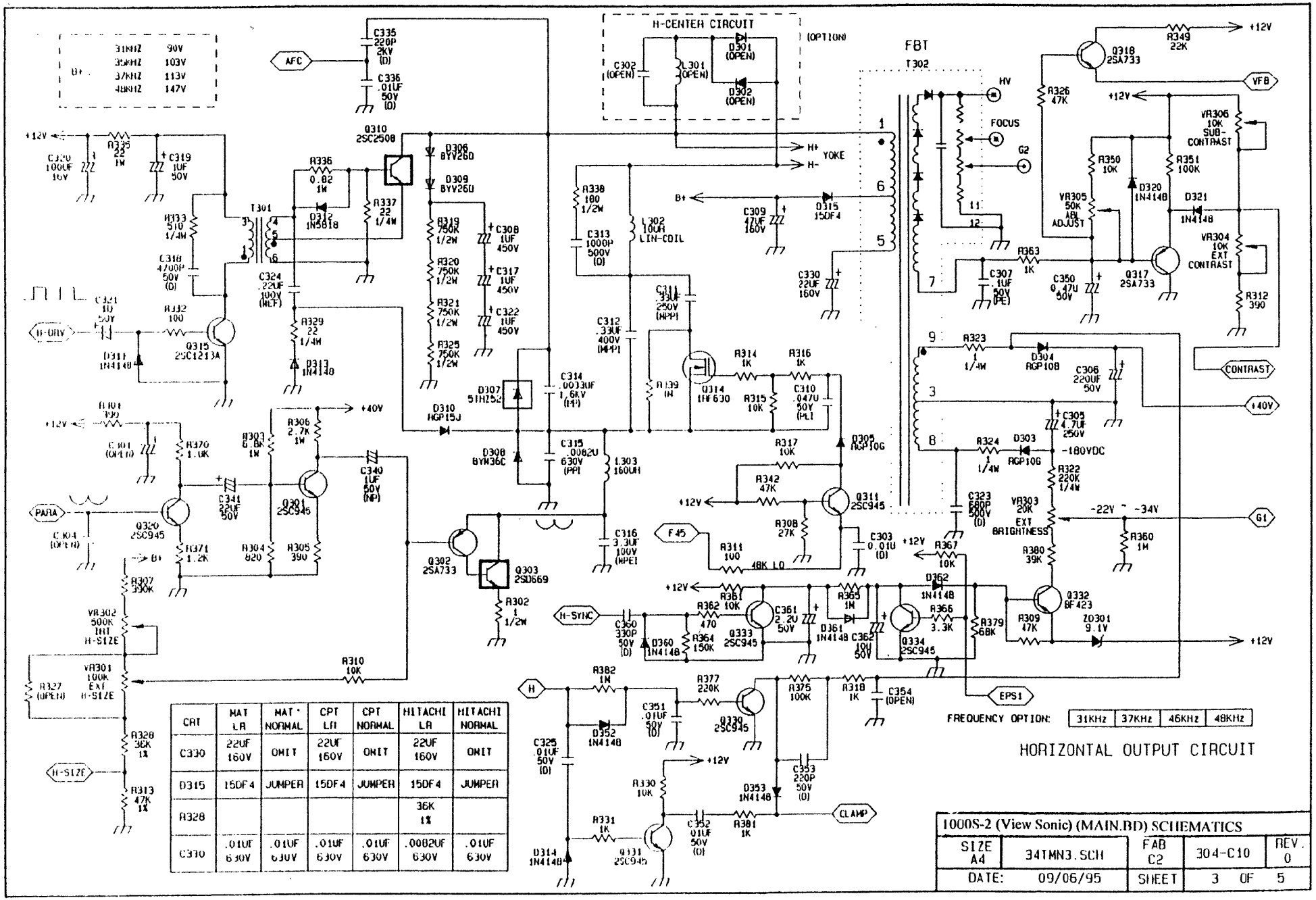


CRT	MAT LR	MAT NORMAL	CPT LR	CPT NORMAL	HITACHI LR	HITACHI NORMAL
R280	2.0K 1%	1.8K 1%	2.0K 1%	1.8K 1%	1.7K 1%	1.7K 1%

FREQUENCY OPTION:	31KHz	37KHz	46KHz	48KHz

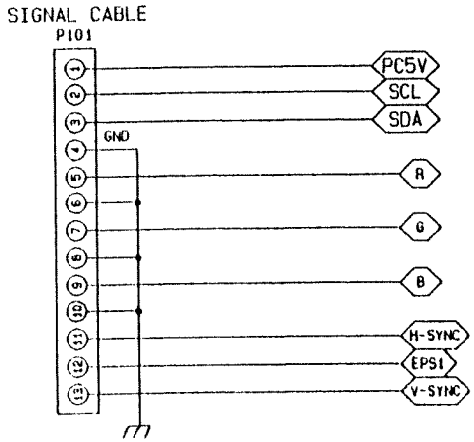
OSC & VERT O/P CIRCUIT

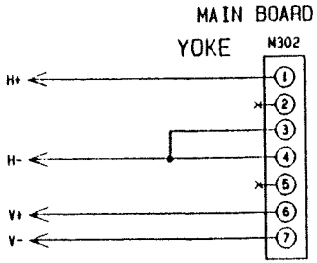
1000S-2 (View Sonic) (MAIN.BD) SCHEMATICS				
SIZE A4	34TMN2.SCH	FAB C3	304-C10	REV. 0
DATE: 09/06/95		SHEET	2 OF 5	

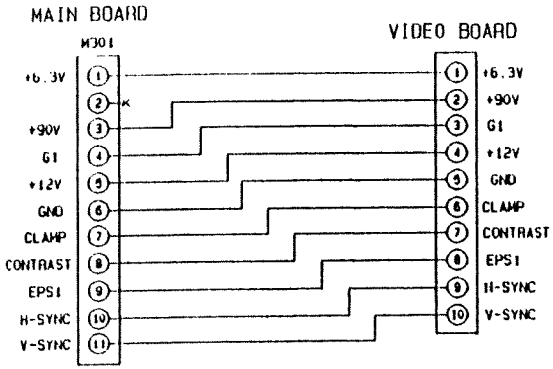


CRT	MAT LR	MAT NORMAL	CPT LR	CPT NORMAL	HITACHI LR	HITACHI NORMAL
C330	22UF 160V	OMIT	22UF 160V	OMIT	22UF 160V	OMIT
D315	15DF4	JUMPER	15DF4	JUMPER	15DF4	JUMPER
R328					36K 1%	
C310	.01UF 630V	.01UF 630V	.01UF 630V	.01UF 630V	.0082UF 630V	.01UF 630V

1000S-2 (View Sonic) (MAIN.BD) SCHEMATICS				
SIZE A4	34TMN3.SCH	FAB C2	304-C10	REV. 0
DATE: 09/06/95		SHEET	3 OF 5	





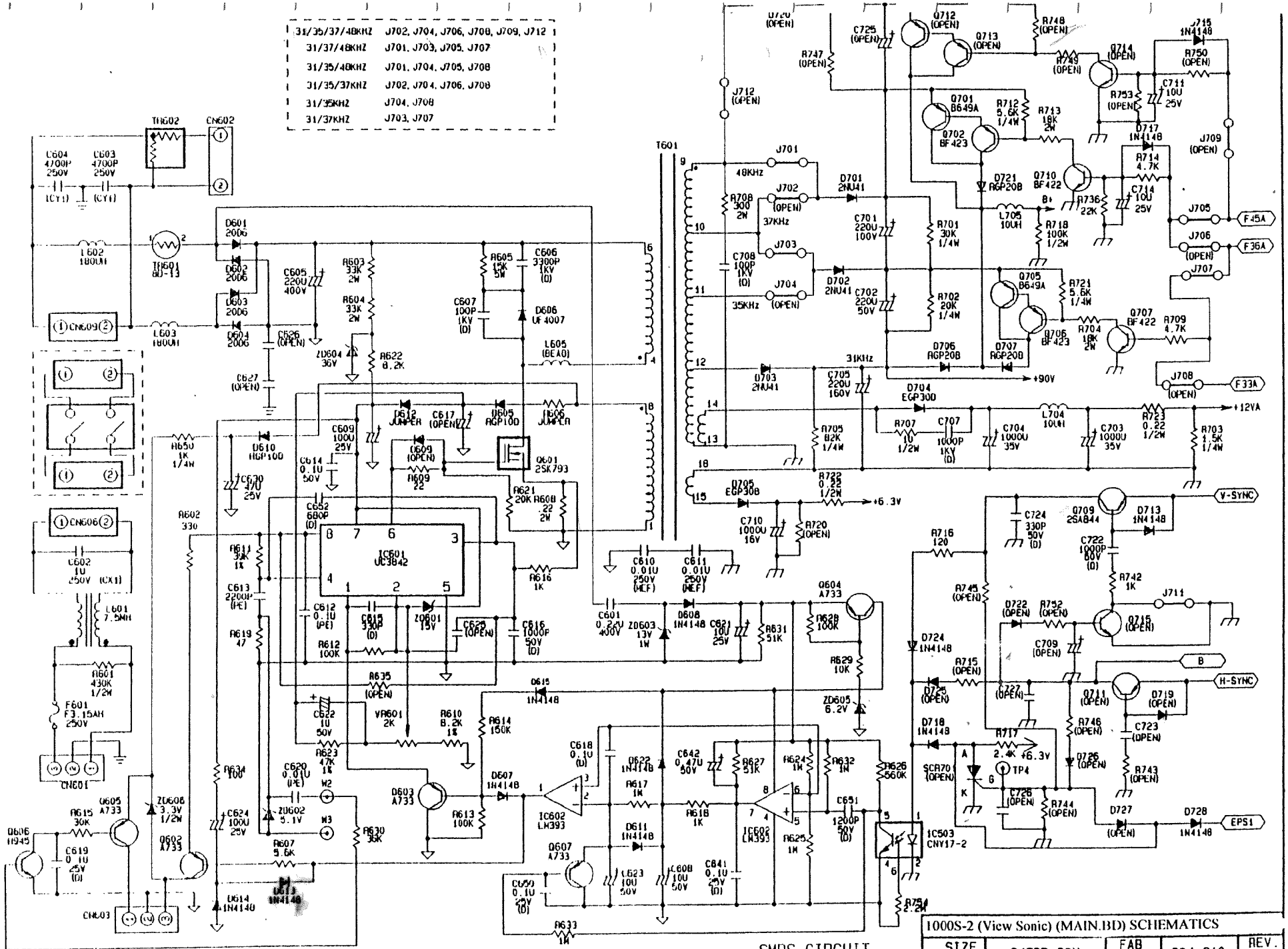


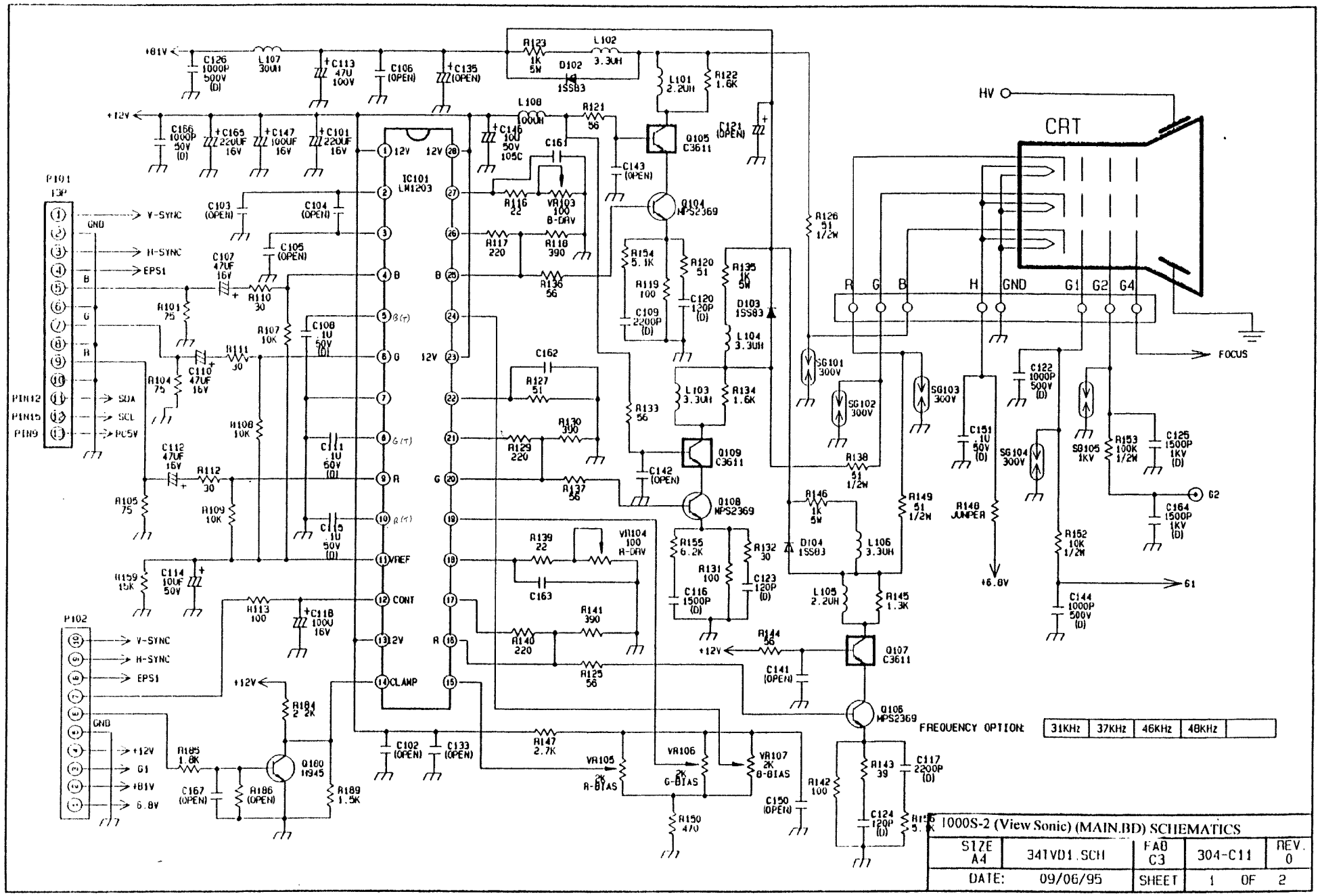
FREQUENCY OPTION:

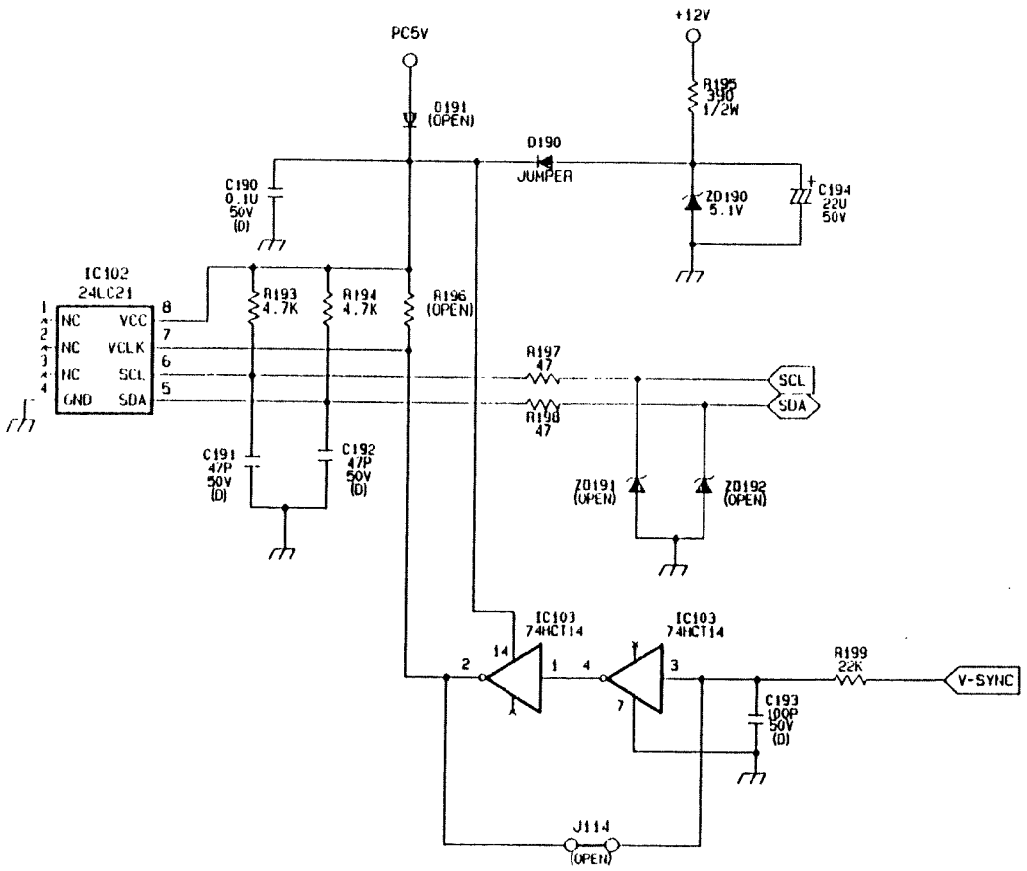
31KHz	37KHz	46KHz	48KHz

CONNECTOR CIRCUIT

1000S-2 (View Sonic) (MAIN.BD) SCHEMATICS				
SIZE A4	34TMN4.SCH	FAB C3	304-C10	REV. 0
DATE:	09/06/95	SHEET	4 OF 5	


31/35/37/48KHZ J702, J704, J706, J708, J709, J712
31/37/48KHZ J701, J703, J705, J707
31/35/48KHZ J701, J704, J705, J708
31/35/37KHZ J702, J704, J706, J708
31/35KHZ J704, J708
31/37KHZ J703, J707
SMPS CIRCUIT
FREQUENCY OPTION: 31KHz 37KHz 46KHz 48KHz
1000S-2 (View Sonic) (MAIN.BD) SCHEMATICS
SIZE A3
34TSP.SCH
FAB C3
304-C10
REV. 0
DATE: 09/06/95
SHEET 5 OF 5


CRT
HV
R G B H GND G1 G2 G4
FOCUS
G1
G2
IC101 LM1203
P101
P102
V-SYNC
H-SYNC
EPS1
SDA
SCL
PC5V
+12V
+81V
+6.8V
GND
G1
B-DRV
R-DRV
G-DRV
VREF
CONT
CLAMP
B-BIAS
R-BIAS
G-BIAS
FREQUENCY OPTION
31KHz
37KHz
46KHz
48KHz
1000S-2 (View Sonic) (MAIN.BD) SCHEMATICS
SIZE A4
341VD1.SCH
PAD C3
304-C11
REV. 0
DATE: 09/06/95
SHEET 1 OF 2



1000S-2 (View Sonic) (MAIN.BD) SCHEMATICS				
SIZE A4	34TVD2.SCH	FAB C3	304-C11	REV. 0
DATE :	09/06/95	SHEET	2 OF 2	

Spare Parts List

Item	PART No.	Description	Location
1	55.75401.011	Main Board	
2	55.76503.011	Video Board	
3	55.75403.011	LED Board	
4	39.75301.143	Case Upper ABS 94VO 072 7134TL/VS	
5	41.75303.061	Bezel ABS 072 34T/VS	
6	44.75401.222	CTN AB 477*448*398 ORI 34TL/VS	
7	47.75318.001	Cushion Right EPS	
8	47.75319.001	Cushion Left EPS	
9	60.73101.203	Assembly Base 7031/AA	
10	50.75304.041	S.A. 10/15P 175CM MCS-002 W/SAV	
11	19.90015.001	Coil Degaussing	
12	19.70026.001	Transformer FBT	T302
13	17.60018.00A	Therm 100/18 PTC 18*13*18	TR602
14	17.60021.8R0	Therm 8 NTC 11.5D	TR601
15	06.00422.010	XTOR BF422 TO-92 NPN p RT	Q710, 707
16	06.00423.010	XTOR BF423 TO-92 PNP P R	Q332, 702, 706
17	06.00517.010	Transistor BC517 TO-92 NPN P	Q253
18	06.00630.020	FET MOS IRF630 NC TO-220	Q314
19	06.00649.01A	XTOR 2SB649A C TO-126 PNP P	Q701, 705
20	06.00669.01A	XTOR 2SD669A C TO-92 NPN P	Q303
21	06.00733.011	XTOR 2SA733 P TO-92 PNP P RT	Q203, 302, 602, 307, 252
22	06.00793.020	FET MOS 2SK793 NC TO-3P	Q601
23	06.00945.010	XTOR H945 P TO-92 NPN P R	Q201, 202, 204-6, 250 251, Q301, 311 320, 330, 311, 180
24	06.01213.01A	XTOR H945 P TO-92 NPN R	Q315
25	06.02508.010	XTOR 2SC1213A C TO-92 NPN P RT	Q310
26	06.1R0A0.122	DIODE FAST UF4007 1KV 1A	D606
27	06.1R005.030	DIODE REC 1N4001 50V 1A D0-41	D612
28	06.1R010.120	DIODE FAST RG10B 100V 1A	D606
29	06.1R020.121	DIODE FAST RG10D 200V 1A	D605, 610
30	06.1R040.120	DIODE FAST RGP10G 400V 1A	D303, 305
31	06.1R540.121	DIODE FAST 15DF4 400V 1.5A	D315
32	06.12R03.070	DIODE ZEN 12V 1/2W D0-35 5%	ZD250
33	06.13R03.070	DIODE ZEN 13V 1W D0-41 5%	ZD603
34	06.18R03.070	DIODE ZEN 18V 1/2W D0-35 5%	ZD601
35	06.2R0A0.120	DIODE FAST 2NU41 1KV 2A	D701-703
36	06.2R010.120	DIODE FAST RGP20B 100V 2A	D701-703
37	06.2R060.030	DIODE REC 20D6 600V 2A D0-41	D601-604
38	06.3R0F0.120	DIODE FAST 3THZ52 1.5KV 3A	D307
39	06.3R010.122	DIODE FAST EGP30B 100V 3A	D704, 705
40	06.3R060.123	DIODE FAST BYM36C 600V 3A	D308

Item	PART No.	Description	Location
41	06.02369.011	XTOR PH2369 TO-92 NPN P RT	Q104, 106, 108
42	06.03611.010	Transistor 2SC3611 TO-1268 NPN	Q105, 107, 109
43	06.1SS83.040	DIODE SW 1SS83 300V 0.2A D0-35	D102-104
44	04.00393.020	IC V.C LM393 DIP 8P	IC602
45	04.03842.040	IC V.R. UC3842 DIP 8P	IC601
46	04.04852.070	IC H/V DEF DRV TDA4852 SIP 9P	IC251
47	04.04866.070	IC VER DEF DRV TDA4866 SIP9P	IC250
48	07A	IC SYB SIG DSCRM WT8043 DIP 20P	IC201
49	04.01203.010	IC RGB Video AMP LM1203 DIP	IC101
50	05.0082A.010	IC OPTO CNX82A DIP 6P	IC603
51	26.13151.113	FUSE 3.15A 250V ST20 ST20 F/H SEMKO	F601

CAUTION: *For continued protection against risk of fire, replace only with Schurter AG, Type SP, rated 3.15A, 250V.*

For continued protection against risk of fire, replace only with Littelfuse Inc. Type 2163.15, rated 3.15A, 250V.